

Agronomy Of Field Crops

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Agricultural Finance and Management - S. Subba Reddy 1996

Crop Physiology Case Histories for Major Crops - Victor Sadras 2020-12-05

Crop Physiology: Case Histories of Major Crops updates the physiology of broad-acre crops with a focus on the genetic, environmental and management drivers of development, capture and efficiency in the use of radiation, water and nutrients, the formation of yield and aspects of quality. These physiological process are presented in a double context of challenges and solutions. The challenges to increase plant-based food, fodder, fiber and energy against the backdrop of population increase, climate change, dietary choices and declining public funding for research and development in agriculture are unprecedented and urgent. The proximal technological solutions to these challenges are genetic improvement and agronomy. Hence, the premise of the book is that crop physiology is most valuable when it engages meaningfully with breeding and agronomy. With contributions from 92 leading scientists from around the world, each chapter deals with a crop: maize, rice, wheat, barley, sorghum and oat; quinoa; soybean, field pea, chickpea, peanut, common bean, lentil, lupin and faba bean; sunflower and canola; potato, cassava, sugar beet and sugarcane; and cotton. A crop-based approach to crop physiology in a G x E x M context Captures the perspectives of global experts on 22 crops

Field Crops in Colorado - Warren H. Leonard 1941

The Sugar Beet Crop - D.A. Cooke 2012-12-06

D.A. Cooke and R.K. Scott Sugar beet is one of just two crops (the other being sugar cane) which constitute the only important sources of sucrose - a product with sweetening and preserving properties that make it a major component of, or additive to, a vast range of foods, beverages and pharmaceuticals. Sugar, as sucrose is almost invariably called, has been a valued component of the human diet for thousands of years. For the great majority of that time the only source of pure sucrose was the sugar-cane plant, varieties of which are all species or hybrids within the genus *Saccharum*. The sugar-cane crop was, and is, restricted to tropical and subtropical regions, and until the eighteenth century the sugar produced from it was available in Europe only to the privileged few. However, the expansion of cane production, particularly in the Caribbean area, in the late seventeenth and the eighteenth centuries, and the new sugar-beet crop in Europe in the nineteenth century, meant that sugar became available to an increasing proportion of the world's population.

Contested Agronomy - James Sumberg 2012-03-15

The dramatic increases in food prices experienced over the last four years, and their effects of hunger and food insecurity, as well as human-induced climate change and its implications for agriculture, food production and food security, are key topics within the field of agronomy and agricultural research. Contested Agronomy addresses these issues by exploring key developments since the mid-1970s, focusing in particular on the emergence of the neoliberal project and the rise of the participation and environmental agendas, taking into consideration how these have had profound impacts on the practice of agronomic research in the developing world especially over the last four decades. This book explores, through a series of case studies, the basis for a much needed 'political agronomy' analysis that highlights the impacts of problem framing and narratives, historical disjunctures, epistemic communities and the increasing pressure to demonstrate 'success' on both agricultural research and the farmers, processors and consumers it is meant to serve. Whilst being a fascinating and thought-provoking read for professionals in the Agriculture and Environmental sciences, it will also appeal to students and researchers in agricultural policy, development studies, geography, public administration, rural sociology, and science and technology studies.

Agronomy for Development - James Sumberg 2017-07-06

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contributors -- Acknowledgements -- 1 Knowledge politics in development-oriented agronomy -- 2 On the movement of agricultural technologies: packaging, unpacking and situated reconfiguration -- 3 South-South cooperation and agribusiness contestations in irrigated rice: China and Brazil in Ghana -- 4 GM crops 'for Africa': contestation and knowledge politics in the Kenyan biosafety debate -- 5 Systems research in the CGIAR as an arena of struggle: competing discourses on the embedding of research in development -- 6 One step forward, two steps back in farmer knowledge exchange: 'scaling up' as Fordist replication in drag -- 7 When the solution became a problem: strategies in the reform of agricultural extension in Uganda -- 8 Sweet 'success': contesting biofortification strategies to address malnutrition in Tanzania -- 9 Crops in context: negotiating traditional and formal seed institutions -- 10 Laws of the field: rights and justice in development-oriented agronomy -- 11 A golden age for agronomy? -- References -- Index

Introduction to Agronomy: Food, Crops, and Environment - Craig C. Sheaffer 2012-08-08

This full-color introduction to agronomy and crop science offers both traditional agricultural students and students with nonagricultural backgrounds a timely look at the principles of crop science, sustainable agriculture, and a host of related societal issues. A must-read text for anyone interested in what are arguably the most profoundly important issues of our time, INTRODUCTION TO AGRONOMY, second edition addresses the basics of safe and sustainable food and fiber production as well as big picture topics such as energy, ecology, and environmental quality. Throughout the text, readers will find information and illustrations on the latest agricultural methods, regulations, and practices--and how each is impacting our society and each individual within it. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Fertilizer Application on Crop Yield - Jagadish Timsina 2019-04-02

Fertilizer application can increase crop yields and improve global food security, and thus has the potential to eliminate hunger and poverty. However, excessive amounts of fertilizer application can contribute to groundwater pollution, greenhouse gas emissions, eutrophication, deposition and disruptions to natural ecosystems, and soil acidification over time. Small farmers in many countries think inorganic fertilizers are expensive and degrade soils, and thus policymakers want to promote organic instead of inorganic fertilizers. To develop practical fertilizer recommendations for farmers, yield responses to applied fertilizers from inorganic and organic sources, indigenous nutrient supply from soil, and nutrient use efficiency require consideration. There is a lack of sufficient scientific understanding regarding the need and benefit of integrated nutrient management (i.e., judicious use of inorganic and organic sources of nutrients) to meet the nutrient demand of high-yielding crops, increase yields and profits, and reduce soil and environmental degradation. Inadequate knowledge has constrained efforts to develop precision nutrient management recommendations that aim to rationalize input costs, increase yields and profits, and reduce environmental externalities. This Special Issue of the journal provided some evidence of the usefulness of integrated nutrient management to sustain soil resources and supply nutrients to crops grown with major cereal and legume crops in some developing countries.

Modern Agronomy - Roy Tucker 2020-09-15

The science and technology of the production and use of plants for food, fiber, fuel and land reclamation may be termed as agronomy. The field encompasses the areas of plant physiology, plant genetics, soil science and meteorology. Some of the issues dealt under agronomy are the management of the environmental impact of agriculture, creation of healthier food and generation of energy from plants. Plant breeding, soil fertility, weed control, irrigation and drainage, pest control, etc. are important focus areas of agronomic studies. Modern agronomy is concerned with the production of the crops with improved nutritional value and increased crop yields under diverse environmental conditions.

This is possible through selective breeding of crops. In addition, the quality of the soil needs to be preserved and the effects of erosion controlled. The field of agronomy addresses all these vital issues. The various sub-fields of agronomy along with technological progress that have future implications are glanced at in this book. It includes some of the vital pieces of work being conducted across the world, on various topics related to agronomy. For someone with an interest and eye for detail, this book covers the most significant topics in this field.

Modern Techniques of Raising Field Crops - Chhidda Singh 1983

Describes modern management practices with regard to all of the major crops in India comprising cereals, millets, pulses, oilseeds, fibre crops, forage and sugar crops. The book contains the latest, authoritative and readily-usable information on the improved farming techniques for stepping up crop productivity. Information gathered is for use by students, teachers, extension workers and others interested in the agricultural prosperity of the nation.

Field Crop Arthropod Pests of Economic Importance - Peter A. Edde 2021-08-21

Field Crop Arthropod Pests of Economic Importance presents detailed descriptions of the biology and ecology of important arthropod pest of selected global field crops. Standard management options for insect pest control on crops include biological, non-chemical, and chemical approaches. However, because agricultural crops face a wide range of insect pests throughout the year, it can prove difficult to find a simple solution to insect pest control in many, if not most, cropping systems. A whole-farm or integrated pest management approach combines cultural, natural, and chemical controls to maintain insect pest populations below levels that cause economic damage to the crop. This practice requires accurate species identification and thorough knowledge of the biology and ecology of the target organism. Integration and effective use of various control components is often enhanced when the target organism is correctly identified, and its biology and ecology are known. This book provides a key resource toward that identification and understanding. Students and professionals in agronomy, insect detection and survey, and economic entomology will find the book a valuable learning aid and resource tool. Includes insect synonyms, common names, and geographic distribution Provides information on natural enemies Is thoroughly referenced for future research

Yield Gains in Major U.S. Field Crops - Stephen Smith 2020-01-22

When humankind began to save seed to plant for the next season, they did so hoping to secure a food supply for the future. With that came the inevitable question: Will it be enough? Scientists today are still asking that question. Our dependence on domesticated cultivated varieties has never been greater, even as increasing populations strain our resource base. This book provides a fascinating snapshot-in-time account of the productivity status of all major U.S. field crops. Each crop has a different story to tell. Plant breeding, biotechnology, and agronomy have shaped these stories. It is imperative that we learn from them to ensure continued productivity. The solution is long-term stewardship and the most effective use of our critical resources—water, soil, genetic resources, and human intellect.

Nitrogen in Agricultural Systems - James Stuart Schepers 2008

Review of the principles and management implications related to nitrogen in the soil-plant-water system.

Drought Effects on Field Crops, 1979-1988 - Jayne T. MacLean 1988

Agronomy of Field Crops - S. R. Reddy 2004

Crop Adaptation to Climate Change - Shyam Singh Yadav 2011-08-02

A major task of our time is to ensure adequate food supplies for the world's current population (now nearing 7 billion) in a sustainable way while protecting the vital functions and biological diversity of the global environment. The task of providing for a growing population is likely to be even more difficult in view of actual and potential changes in climatic conditions due to global warming, and as the population continues to grow. Current projections suggest that the world's temperatures will rise 1.8-4.0 by 2100 and population may reach 8 billion by the year 2025 and some 9 billion by mid-century, after which it may stabilize. This book addresses these critical issues by presenting the science needed not only to understand climate change effects on crops but also to adapt current agricultural systems, particularly in regard to genetics, to the changing conditions. Crop Adaptation to Climate Change covers a spectrum of issues related to both crops and climatic conditions. The first two sections provide a foundation on the factors involved in climate stress, assessing current climate change by region and covering crop

physiological responses to these changes. The third and final section contains chapters focused on specific crops and the current research to improve their genetic adaptation to climate change. Written by an international team of authors, Crop Adaptation to Climate Change is a timely look at the potentially serious consequences of climate change for our global food supply, and is an essential resource for academics, researchers and professionals in the fields of crop science, agronomy, plant physiology and molecular biology; crop consultants and breeders; as well as climate and food scientists.

Yield gap analysis of field crops - Food and Agriculture Organization of the United Nations 2018-06-29

To feed a world population that will exceed 9 billion by 2050 requires an estimated 60% increase over current primary agricultural productivity. Closing the common and often large gap between actual and attainable crop yield is critical to achieve this goal. To close yield gaps in both small and large scale cropping systems worldwide we need (1) definitions and techniques to measure and model yield at different levels (actual, attainable, potential) and different scales in space (field, farm, region, global) and time (short and long term); (2) identification of the causes of gaps between yield levels; (3) management options to reduce the gaps where feasible and (4) policies to favour adoption of sustainable gap-closing solutions. The aim of this publication is to critically review the methods for yield gap analysis, hence addressing primarily the first of these four requirements, reporting a wide-ranging and well-referenced analysis of literature on current methods to assess productivity of crops and cropping systems.

Industrial Hemp as a Modern Commodity Crop, 2019 - David W. Williams 2020-01-22

Hemp as a Modern U.S. Commodity Crop provides an overview of industrial hemp as an agronomic crop in western cropping systems. Emphasis is given to the long history of hemp, mostly in the United States, and to current production issues pertinent in the US as well as Europe and Canada. There are many questions still to be answered – starting with those to be addressed by the most basic classical plant breeding techniques and continuing to the most modern analytical techniques of plant tissues and genetics.

Advances in Agronomy - 2009-09-19

Advances in Agronomy continues to be recognized as a leading reference and a first-rate source for the latest research in agronomy. As always, the subjects covered are varied and exemplary of the myriad of subject matter dealt with by this long-running serial. * Maintains the highest impact factor among serial publications in agriculture * Presents timely reviews on important agronomy issues * Enjoys a long-standing reputation for excellence in the field

Agronomic Crops - Mirza Hasanuzzaman 2020-03-09

Agronomic crops have been a source of foods, beverages, fodders, fuels, medicines and industrial raw materials since the dawn of human civilization. Over time, these crops have come to be cultivated using scientific methods instead of traditional methods. However, in the era of climate change, agronomic crops are increasingly subjected to various environmental stresses, which results in substantial yield loss. To meet the food demands of the ever-increasing global population, new technologies and management practices are being adopted to boost yield and maintain productivity under both normal and adverse conditions. To promote the sustainable production of agronomic crops, scientists are currently exploring a range of approaches, which include varietal development, soil management, nutrient and water management, pest management etc. Researchers have also made remarkable progress in developing stress tolerance in crops through various approaches. However, finding solutions to meet the growing food demands remains a challenge. Although there are several research publications on the above-mentioned problems, there are virtually no comprehensive books addressing all of the recent topics. Accordingly, this book, which covers all aspects of production technologies, management practices, and stress tolerance of agronomic crops in a single source, offers a highly topical guide.

Agronomy and Crop Science - Jamie Hanks 2016-07-29

Agronomy is the field of science that takes into account a more holistic and integrated view of the agriculture and all the important fields related to it. It encompasses soil classification, crop rotation, irrigation and drainage, plant physiology, plant breeding, soil fertility, weed control, insect and pest control. Crop science on the other hand focuses on the effects of drought, water use efficiency, effect of temperatures on crops, mineral deficiency and toxicity stress and to reduce them. These are overlapping fields as they both concentrate on crops. This book attempts

to understand the multiple branches that fall under the disciplines of agronomy and crop science and how such concepts have practical applications. The various studies that are constantly contributing towards advancing technologies and evolution of these fields are examined in detail. From theories to research to practical applications, case studies related to all contemporary topics of relevance to this field have been included in this book. It will help the readers in keeping pace with the rapid changes in this field. It will serve as a reference to a broad spectrum of readers.

The Production of Field Crops - Thomas Barksdale Hutcheson 1924

Modern Techniques of Raising Field Crops - Chhidda Singh 1983

Describes modern management practices with regard to all of the major crops in India comprising cereals, millets, pulses, oilseeds, fibre crops, forage and sugar crops. The book contains the latest, authoritative and readily-usable information on the improved farming techniques for stepping up crop productivity. Information gathered is for use by students, teachers, extension workers and others interested in the agricultural prosperity of the nation.

The Agronomy and Economy of Important Tree Crops of the Developing World - K.P. Prabhakaran Nair 2010-04-22

Major tree crops contribute substantially to the economy of many developing countries on the Asian, African and Latin American continents. For example, coffee is the main revenue earner for Kenya. This book provides a comprehensive review of the agronomy, botany, taxonomy, genetics, chemistry, economics, and future global prospects of a range of crops that have great food, industrial and economic value such as cocoa, coffee, cashew, oil palm and natural rubber. Discusses the major tree crops of great economic value to the developing world The author is an eminent scientist who has won numerous awards for his work in this area

Agronomic Handbook - Jr., J. Benton Jones 2002-10-29

Many agronomic reference books either focus on a single crop, several related crops, or specific soil topics but not on a full range of both crop and soil subjects. This unique handbook covers both major agronomic fields. Containing essential data and information on the culture of the world's major agronomic grain, oil, fiber, and sugar crops grown

Precision Agriculture Basics - D. Kent Shannon 2020-01-22

With the growing popularity and availability of precision equipment, farmers and producers have access to more data than ever before. With proper implementation, precision agriculture management can improve profitability and sustainability of production. Precision Agriculture Basics is geared at students, crop consultants, farmers, extension workers, and practitioners that are interested in practical applications of site-specific agricultural management. Using a multidisciplinary approach, readers are taught to make data-driven on-farm decisions using the most current knowledge and tools in crop science, agricultural engineering, and geostatistics. Precision Agriculture Basics also features a stunning video glossary including interviews with agronomists on the job and in the field.

A Textbook of Agronomy - B. Chandrasekaran 2010

Agronomy Guide for Field Crops - Ontario. Ministry of Agriculture, Food and Rural Affairs 2002

This guide is designed to be a reference for detailed information related to the production, pest management, harvest, and storage of the field crops produced in Ontario. Chapter 1 outlines basic crop scouting procedures and the proper initiation of on-farm trials. Chapter 2 discusses various aspects of soil management & fertilizer uses that are common to all field crops in Ontario. The remainder of the guide focusses on each field crop commodity separately, covering such matters as tillage, variety selection, planting, fertility, harvesting, storage, weed control, insect & disease information, and crop problems specific to each commodity. A final chapter focusses on proper grain storage and the control of stored grain insect pests.

Agronomy - American Society of Agronomy 2016-09-01

Sorghum - Ignacio A. Ciampitti 2020-01-22

Sorghum is among the top five cereals and one of the key crops in global food security efforts. Sorghum is a resilient crop under high-stress environments, ensuring productivity and access to food when other crops fail. Scientists see the potential of sorghum as a main staple food in a future challenged by climate change. The contributors provide a comprehensive review of sorghum knowledge. The discussion covers genetic improvements, development of new hybrids, biotechnology, and

physiological modifications. Production topics include water and nutrient management, rotations, and pest control. Final end uses, sorghum as a bioenergy crop, markets, and the future of sorghum are presented. IN PRESS! This book is being published according to the "Just Published" model, with more chapters to be published online as they are completed.

Agronomy of Field Crops - S. R. Reddy 2004

Advances in Irrigation Agronomy - M. K. V. Carr 2012-04-05

Irrigation has been used for thousands of years to maximize the performance, efficiency and profitability of crops and it is a science that is constantly evolving. This potential for improved crop yields has never been more important as population levels and demand for food continue to grow. Recognising the need for a coherent and accessible review of international irrigation research, this book examines the factors influencing water productivity in individual crops. It focuses on nine key plantation/industrial crops on which millions of people in the tropics and subtropics depend for their livelihoods (banana, cocoa, coconut, coffee, oil palm, rubber, sisal, sugar cane and tea). Linking crop physiology, agronomy and irrigation practices, this is a valuable resource for planners, irrigation engineers, agronomists and producers concerned with the international need to improve water productivity in agriculture in the face of increased pressure on water resources.

The Production of Field Crops - Thomas Barksdale Hutcheson 1936

Cereal or grain crops; Legumes for seed; Forage crops; Root crops; Fiber crops; Tubers; Sugar plants; Stimulants.

TEXTBOOK OF FIELD CROPS - JOSHI, MUKUND 2018-10-01

The book is divided into two parts, kharif crops and rabi crops, covering as many as 48 crops. It contains the latest, authoritative and readily usable information about the cultivation techniques, varieties, nutrient/water/weed management along with specific climatic/soil requirements of all the crops. It is essentially a teaching and study material as it is written conforming to ICAR syllabus, strictly considering the limitations of the students and the teachers. Information on each crop is chosen in such a way that it is readily understandable by the undergraduate students and can be explained by the teachers in 22 weeks of a semester. Unnecessary detailing and research information has been avoided. Photographic illustrations of the crops are given to enable the students to understand the morphology of the crop clearly. Related terms, concepts or recent advancements in each crop are highlighted in the box. For a group of related crops, model questions are also given to visualise the probable questions on each crop. An attempt has been made to include the latest statistics from FAO and other global and Indian sources. Points to remember given at the end of each chapter enable the students to have a quick recap of the topic before examination. Further, many general topics, related to field crops, have been covered in eight separate brief chapters, to ensure that the students understand crop-related topics.

North American Agroforestry - Harold E. Gene Garrett 2022-02-23

North American Agroforestry Explore the many benefits of alternative land-use systems with this incisive resource Humanity has become a victim of its own success. While we've managed to meet the needs—to one extent or another—of a large portion of the human population, we've often done so by ignoring the health of the natural environment we rely on to sustain our planet. And by deteriorating the quality of our air, water, and land, we've put into motion consequences we'll be dealing with for generations. In the newly revised Third Edition of North American Agroforestry, an expert team of researchers delivers an authoritative and insightful exploration of an alternative land-use system that exploits the positive interactions between trees and crops when they are grown together and bridges the gap between production agriculture and natural resource management. This latest edition includes new material on urban food forests, as well as the air and soil quality benefits of agroforestry, agroforestry's relevance in the Mexican context, and agroforestry training and education. The book also offers: A thorough introduction to the development of agroforestry as an integrated land use management strategy Comprehensive explorations of agroforestry nomenclature, concepts, and practices, as well as an agroecological foundation for temperate agroforestry Practical discussions of tree-crop interactions in temperate agroforestry, including in systems such as windbreak practices, silvopasture practices, and alley cropping practices In-depth examinations of vegetative environmental buffers for air and water quality benefits, agroforestry for wildlife habitat, agroforestry at the landscape level, and the impact of agroforestry on soil health Perfect for environmental scientists, natural resource professionals and ecologists, North American Agroforestry will also earn a place in the

libraries of students and scholars of agricultural sciences interested in the potential benefits of agroforestry.

Soil Management - Jerry L. Hatfield 2020-01-22

Degradation of soils continues at a pace that will eventually create a local, regional, or even global crisis when diminished soil resources collide with increasing climate variation. It's not too late to restore our soils to a more productive state by rediscovering the value of soil management, building on our well-established and ever-expanding scientific understanding of soils. Soil management concepts have been in place since the cultivation of crops, but we need to rediscover the principles that are linked together in effective soil management. This book is unique because of its treatment of soil management based on principles—the physical, chemical, and biological processes and how together they form the foundation for soil management processes that range from tillage to nutrient management. Whether new to soil science or needing a concise reference, readers will benefit from this book's ability to integrate the science of soils with management issues and long-term conservation efforts.

Principles Of Agronomy - S. R. Reddy 2007-01-01

Principles of Field Crop Production - J. E. Pratley 1994

Commercial crop production in the 1990s involves a series of complicated decisions. The range of pressures which now impact on the modern farmer has increased significantly in recent times. Farmers no longer can rely on the production of commodities but must focus on products, the quality of which must meet market requirements. Economic pressures necessitate an increase in productivity if farmers are to survive financially. At the same time, the community demands that farmers maintain the natural resource base of the land of which they are custodians and that they minimise the inputs of chemicals. *Principles of Field Crop Production* concentrates on the principles associated with farming and addresses the issues of raising productivity and environmental management. This book also endeavours to put crop production in a broader perspective by addressing issues such as the socioeconomic aspects and crop improvement issues relevant to the scope of the book. This new edition updates information on numerous crops, and provides new insights into farming systems and modern breeding methods such as genetic engineering. This new edition continues to fill an important niche for both tertiary and senior secondary students of agronomy and their teachers. It is also an important reference book for research workers and for others involved or interested in agriculture.

Crop Physiology - Victor Sadras 2014-09-17

From climate change to farming systems to genetic modification of organisms, *Crop Physiology, Second Edition* provides a practical tool for understanding the relationships and challenges of successful cropping. With a focus on genetic improvement and agronomy, this book addresses the challenges of environmentally sound production of bulk and quality food, fodder, fiber, and energy which are of ongoing international concern. The second edition of *Crop Physiology* continues to provide a

unique analysis of these topics while reflecting important changes and advances in the relevant science and implementation systems.

Contemporary agriculture confronts the challenge of increasing demand in terms of quantitative and qualitative production targets. These targets have to be achieved against the background of soil and water scarcity, worldwide and regional shifts in the patterns of land use driven by both climate change and the need to develop crop-based sources of energy, and the environmental and social aspects of agricultural sustainability. Provides a view of crop physiology as an active source of methods, theories, ideas, and tools for application in genetic improvement and agronomy. Written by leading scientists from around the world. Combines environment-specific cropping systems and general principles of crop science to appeal to advanced students, and scientists in agriculture-related disciplines, from molecular sciences to natural resources management.

Perspectives for Agronomy - M.K. van Ittersum 1997-12-11

During the 4th ESA-Congress, held in the Netherlands, 7-11 July 1996, a new perspective for agronomy emerged. Various contributions demonstrate the need for a new role of agronomy and its tools. In recent decades, agriculture has evolved from an activity with mainly productivity aims, into an issue conciliating environmental, agricultural, and economic and social objectives. Placing agriculture in such a broadened perspective requires a different agronomy, with new tools and approaches at a range of aggregation levels. It calls for detailed knowledge concerning the functioning, productivity and ecological relationships of agricultural plants and crops. In addition, it calls for a constant update and synthesis of existing and newly generated knowledge, the design of new ideotypes and genotypes, new production technologies, cropping systems, farming systems and agro-ecological land use systems. This proceedings book presents a set of case studies illustrating the various agronomic tools that can be used for specific agronomic questions. The case studies are grouped in sections illustrating relevant subquestions in developing an agriculture with broadened objectives. The book starts with an introductory paper on the role of agronomy in research and education in Europe. The second section deals with agricultural land use, food security and environment. This is followed by a set of papers describing experimental research and modeling approaches used to design new ideotypes of crops, including physiological properties in relation to growth factors such as radiation, CO₂, temperature and water. Sustained soil fertility directly links to nutrient cycling and soil organic matter. A selected set of papers addresses the improvements in resource use efficiency and as such their contribution towards economic, environmental and agricultural objectives. The final section addresses the design of integrated and ecological arable farming systems. It highlights the role of prototyping interaction with leading-edge farmers, as promising tools to design, implement and test new farming systems. It is hoped that the activities of the European Society for Agronomy and the Proceedings of its 4th Congress will stimulate to serve the new perspectives of agronomy, i.e. to adopt ecological principles, to optimally manage the use of resources and to meet social and economic objectives.